

THE ECONOMICS OF STRIP COAL MINING WITH
SPECIAL REFERENCE TO KNOX AND
FULTON COUNTIES, ILLINOIS

BY

HERMAN DOMINIC GRAHAM

B. Ed., Illinois State Normal University, 1938

A. M., University of Illinois, 1939

AN ABSTRACT OF A THESIS

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
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Illinois is the third largest coal producing state in the United States, and has the largest mineable coal reserves of any state east of the Mississippi River. Coal mining in Illinois, as in other coal producing states, has been plagued during the last twenty years by high labor costs, by high and inelastic transportation costs, and by increasing competition from fuel oil and gas. As a result of these forces the number of coal mines has declined and the number of men employed by the mines has declined. In 1920 Illinois had 373 shipping mines, which employed about 85,000 men; and in 1945 Illinois had 159 shipping mines, which employed about 28,000 men. During this period of general decline, however, the number of strip mines, the number of employees of strip mines, and the number of tons of coal mined by strip mines have increased rapidly. In 1920 strip mines (often called "open cut mines" or "strip pits") accounted for 0.57 per cent of Illinois coal tonnage, and in 1945 the strip pits mined 22 per cent of Illinois coal tonnage. The reasons for the rapid and extensive growth of coal stripping during a period of stagnation and decline for the coal industry as a whole are described in the following pages.

One of the most obvious reasons for the growth of open cut mining is that it is inherently a less complicated process than is deep mining. There are no timbering, no hoist and shaft, no ventilation, no lighting, and no drainage problems comparable to the underground mines. There are no methane gas, no explosive dust mixtures, no cramped working spaces, and no need to withdraw men from the mine when blasting. Other reasons for the increasing use of the open cut are that strip mines recover from 75 per cent to almost 100 per cent of the coal bed being mined as compared to 50 per

cent to 60 per cent extraction by underground mines; strip mines achieve full planned production within a few days after the mine is opened while underground mines require several months or years to get enough passageways and rooms opened up to permit full, planned production; strip mine machinery is more adaptable to other uses and, therefore, has a higher salvage value than does underground machinery; strip mines use large units of capital equipment and relatively few workers so that the labor costs of a strip mine average about 40 per cent of total costs while in underground mines labor costs account for 60 per cent to 70 per cent of total costs; and finally the trends in prices of coal, land, labor, and interest rates have been more favorable to strip mines than to deep mines.

Since 1920 the trend of interest rates has been downward, and the price of land has also declined generally since that date. The trend in the price of labor has not, however, followed the trend of land prices and interest rates. In the late 1920's the price of coal declined steadily while in Illinois wage rates were held high. Illinois is strongly unionized and the result of union strength was a high, inflexible wage rate during a period of falling land prices, falling interest rates, and falling prices for coal. After a drop in wages in the early thirties, miners' wages again increased while land prices and interest rates continued to decline, or at least remained relatively stable without substantial increase. The result of these price relationships which existed between 1920 and 1940 was an attempt by coal operators to economize on the use of labor—the expensive factor of production—and it is more than coincidence that the open cut method of mining experienced its greatest growth during this twenty year period. The open cut mines use a large amount of capital, large units of equipment, extensive tracts of land, and small amounts of labor. This type of mining has progressed since 1920 because of its physical characteristics, because of the technical improvements in machinery, and because its cost requirements can

meet the prevailing price relationships of the factors of production better than can deep mines.

The open cut mines by their lavish use of land have aroused much criticism and opposition to stripping so that the State of Illinois and several other states have passed laws at various times which would either hamper, restrict, or even put out of business any operator engaged in strip mining. The main characteristic of the industry is that it destroys land, i. e., makes it unfit for row crops. Strip mining and general farming seem to be completely incompatible with no chance of compromise.

It is true that after land is stripped it is unfit for row crops and cannot be cultivated, but there are other uses for it. Stripped lands can be made into recreation centers, trees grow well on stripped land, and a grazing project in Fulton county has proved very successful. Sweet clover and grasses grew so well on 600 acres of stripped land in Fulton county that the land was pastured only two years after being stripped. Present evidence does not show widespread general success in finding new uses for stripped land, but enough has been done to show that there are great possibilities for productive uses of the seemingly worthless land.

Many people recognize that stripping ruins land for general cultivation, some people will grant that new, alternate uses for the stripped land may be devised, but few people consider the value of the coal extracted. An acre of ground capable of raising one hundred bushels of corn may be underlain by several thousand tons of coal. Is it a better utilization of our natural resources to raise corn or some other crop on that land for an infinite number of years or is it better to excavate some 6,000 tons of coal per acre (assuming a four foot seam computed at 1,500 tons per acre foot) in one year? In the former case society gets a small yearly harvest for a long period of time, and in the latter case a tremendous yield is obtained immediately with no hope of any future yield. If the value of the average annual crop yield per

acre in Fulton county is compared to the average value of the coal per acre extracted in that county it shows that the average acre of coal is over 250 times as valuable (in terms of money) as the farm crop. Thus an acre of Fulton county soil would have to bear crops for over 250 years to equal the value of one acre of coal. This computation makes no allowance for time preference or for the costs and labor expended in farming during that 250 year period. If such a computation could be done it would assign a still higher value to the present value of coal which is extracted in one operation and made available for use immediately.

The mutually exclusive character of coal stripping and general farming is not simplified by the fact that land and coal are both relatively abundant in Illinois and in the United States. There is, however, a difference in the markets for coal and the markets for grain and livestock. Illinois strip lands account for less than one per cent of the state's area and the nature of the grain and livestock market is such that retirement of these 80,000 acres from production will have practically no effect on prices of farm products or on costs of raw materials to any large industry. This strip land which is such a small percentage of the state's area, however, produces between one-fifth and one-fourth of Illinois coal production. If coal stripping were prohibited cities such as the Tri-Cities and Peoria, which depend largely on strip coal, would have their yearly fuel costs increased from \$300,000 to \$500,000 per year for each city. In 1945 Illinois mined over 16,000,000 tons of strip coal, and if this were withdrawn from the market the deficiency would be made up by hauling coal from more distant coal fields with consequent higher freight rates. The result could well be an increased fuel bill for Illinois of \$16,000,000 per year.

Another aspect of the industry is the characteristics of its labor force. Strip miners are different from underground workers in several ways. In the first place, strip miners are paid more, as a general rule, than are shaft or

slope miners. Not only are the men in the strip pits paid more but also their skills are adaptable to other industries and uses. This feature gives the open cut workers a mobility and independence not found among deep miners. Strip miners are truck drivers, electricians, tractor operators, mechanics, shovel operators, and machinists—trades which are in demand in industries other than mining. Deep miners, on the contrary, are dependent on the mines for a livelihood. A loading machine operator or a cutting machine operator is a skilled worker who receives good wages, but if the mine closes he is out of a job and his skill is not demanded by other industries. The combination of high wages and mobility of workers, which is characteristic of strip mine workers, is largely responsible for the fact that there are no company towns or coal towns in the stripping areas of Illinois. Many of the open cut workers are widely dispersed over an area of ten to thirty miles radius from the mine. The men drive to work and live on farms or in towns of their own choosing.

The strip miners enjoy still another advantage over underground workers—men in strip mines are much safer while at work than are workers underground. Illinois mines take their toll of human lives every year. Since 1882 there have been 121 fatalities per year on an average in all Illinois mines. Of these fatalities strip mines have contributed from zero to eight per year since 1927, the first year for which fatalities are listed. Illinois strip mines produce from one-fifth to one-fourth of the state's coal and account for only four per cent of the state's mining fatalities. In terms of human life (an intangible, unmeasurable cost, but one which is exceedingly high) strip mining is the most economical method yet devised for extracting coal (the nation's largest source of power) from the earth.

Men who work in the strip pits also have fewer non-fatal accidents than do underground workers. In 1945 underground men experienced 2,783 injuries (involving a loss

of seven days work or more) while strip miners had 385 injuries. Of injuries involving a loss of thirty days or more underground men had 1,145 while strip miners had 56. These losses converted into man days of labor lost are 76,272 for underground workers and 4,223 for strip mine workers. Strip mines in Illinois in 1945 accounted for 4.8 per cent of all mining injuries in the state and 5.5 per cent of the man days lost.

The open cut mines in Illinois receive little public acknowledgment for their record of safety and treatment of workers, but they do receive considerable public opposition because they use up and apparently destroy thousands of acres of good farm land. This lavish use of land holds important implications for local governmental units. Illinois now has approximately 37,000 acres of stripped land which produce practically nothing—they have practically no tax paying ability. The strip mine operators, however, still pay general property taxes on the stripped land and in the whole state less than 200 acres have become delinquent. This is a situation which cannot long endure. Either the operators will quit paying taxes on the land and allow it to revert to the state, or the land will be re-valued so as to conform to its tax paying ability. In either case township governments will suffer a reduction in their taxable property.

Fulton county has 268 subdivisions which depend primarily on proceeds from the general property tax, and any reduction in tax base will either seriously reduce tax revenues or will cause tax rates on remaining property to be increased. Of the twenty-six townships in Fulton county, five townships encompass most of the stripped land in that county. In four of these townships strip mine property contributes from 28 per cent to 44 per cent of total tax revenues to each township. Within the five townships the mines contribute even larger percentages of revenue received by school districts. Two school districts in Buckheart township received over 95 per cent of their revenue from mine property.

in 1945; and nine districts received over 50 per cent of their revenue from strip mine property. This situation has had no serious effects as yet because the valuation of mine lands has not been changed on the tax books. Coal lands carry the same valuation they had as farm land and then after being mined out, the valuation still has remained unchanged.

If after several more years the strippable coal beds in Illinois are mined out and the operators remove their machinery, it seems almost certain that some 70,000 or 80,000 acres of land will either become tax delinquent or will be revalued at a very low figure. All over the state, townships which depend heavily on strip mine property (as do Buckheart, Joshua, Fairview, and Putman townships in Fulton county) will suffer a sharp reduction in their tax base and remaining property will absorb much heavier taxation than it does now with consequent reduction in value and loss to the owners. In fact the available evidence in Fulton and Knox counties indicates that the increased tax load will be heavy; and this study concludes that to forestall such a probability the township governments and their many subdivisions should be consolidated so as to form a political unit large enough to absorb the reduction in tax base without serious harm to the other property owners within that political unit.

Strip mines are accused of many things which are a detriment to society. The mines allegedly harbor reptiles and vermin, cause floods, dry out the land, sever routes of trade, bisect retail trading areas, pollute streams, force people off the land, and menace public health. The facts as they exist in Fulton and Knox counties are that the mines do none of these things to any measurable extent. The spoil banks are unsightly, and the mines will probably affect seriously the public finances of small tax units; but the other common and often repeated charges are without basis at least in Knox and Fulton counties.

A final review of coal stripping shows that the strip mines have met certain economic conditions better than have

many shaft mines, have furnished Illinois with a low priced coal supply, have upearthed several thousand acres of land, have caused an unsightly countryside, have been more economical of human life than have underground mines, and have wiped out any economic justification for township government in strip coal areas in Illinois.

VITA

Herman Dominic Graham was born in Cameron, Illinois, February 24, 1918, and attended public elementary and secondary schools in Monmouth, Illinois. In 1935 he entered Illinois State Normal University, received the Bachelor of Education degree in 1938, and in 1939 received the Master of Arts degree from the University of Illinois. In 1940 he was appointed Sears Roebuck Fellow in Business Organization and Operation, University of Illinois, for the academic year 1940-1941. For the academic years 1941-1942 and 1946-1947 he was a teaching assistant in the Department of Economics. The summer of 1941 was spent at the National University of Mexico, Mexico, D. F.; and from January, 1942, to February, 1946, he was on active duty with the United States Naval Reserve.

